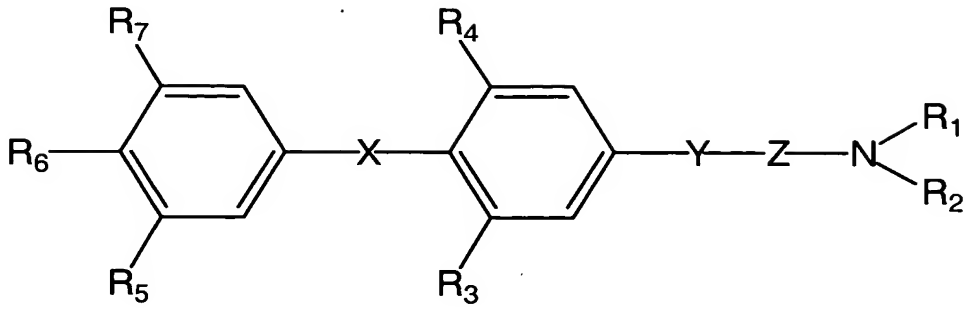
What is Claimed:

1. A compound of formula I:



or a stereoisomer, prodrug, pharmaceutically acceptable salt, hydrate, solvate, acid salt hydrate, N-oxide or isomorphic crystalline form thereof;

wherein independently,

R_1 and R_2 are: H, lower alkyl, cyclic alkyl, or benzyl;

Y and Z are: $-[C(R)_2]_n-$, CHOR, O, S, NR, CONH, or NHCO, provided that Y and Z are not both O, both S, both NR, both CONH, both NHCO, or CONH and NHCO;

R_3, R_4, R_5, and R_7 are: H, I, Br, Cl, F, CH_3, CF_3, CN, SR, OCH_3, CH_2CH_3, or $CH(CH_3)_2$;

R_6 is: OR, H, SH, F, CF_3, lower alkyl, or $N(R)_2$;

X is: O, S, SO, SO_2, NR, $C(R)_2$, –lower alkyl-O-, -O-lower alkyl-, $COCH_2O$, or OCH_2CO; and

R is H, lower alkyl, aryl optionally substituted with 1-3 substituents selected from the group consisting of lower alkyl, halo, hydroxy, and alkoxy; or benzyl wherein said phenyl portion is optionally substituted with 1-3 substituents selected from the group consisting of lower alkyl, halo, hydroxy, and alkoxy;

n is 1 to 6; and

provided that the compound is not thyronamine, 3,5-diiodothyronamine, 3,5,3'-triiodothyronamine, thyroxamine, 3,5,3',5'-tetraiodothyroethanolamine, 3,5,3'-triiodothyroethanolamine, or 3,5-diiodothyroethanolamine.

2. The compound of claim 1, wherein R_4 and R_5 are H, CH_3, CF_3, CN, OCH_3, CH_2CH_3, or $CH(CH_3)_2$.

3. The compound of claim 2, wherein R_1 and R_2 are H, R_3 is I, R_4, R_5, and R_7 are H, R_6 is OH, X is O, Y and Z are each CH_2.

4. The compound of claim 1, wherein R_4 is H, CH_3, CF_3, CN, OCH_3, CH_2CH_3, or $CH(CH_3)_2$; and R_5 is I, Br, Cl, or F.

5. The compound of claim 4, wherein R_1 and R_2 are H, R_4 and R_7 are H, R_3 and R_5 is I, R_6 is OH, X is O, Y and Z are each CH_2.

6. The compound of claim 4, wherein R_1 and R_2 are H, R_4 is H, R_3, R_5, and R_7 are I, R_6 is OH, X is O, Y and Z are each CH_2.

7. The compound of claim 1, wherein R_1 is lower alkyl, R_6 is OH or OR, and X is O.

8. The compound of claim 1, wherein R_3 is a halogen, R_6 is H, and X is O.

9. The compound of claim 1, wherein X is alkoxy.

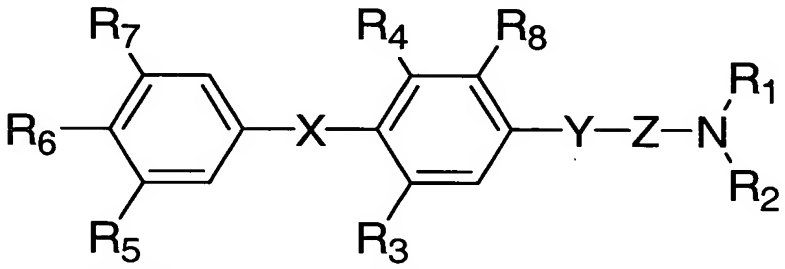
10. The compound of claim 1, wherein R_1 and R_2 are H or lower alkyl, R_6 is H or CF_3, and X is alkoxy.

11. The compound of claim 1, wherein R_1 is H or lower alkyl, and Y is $C(R)_2$.

12. The compound of claim 1, wherein R_1 and R_2 are H or lower alkyl, R_6 is H, X is O, Y is O, and Z is alkyl.

13. The compound of claim 1, wherein Y is $-[C(R)_2]_n-$, where R is aryl and n is 1.

14. A compound of formula II:



or a stereoisomer, prodrug, pharmaceutically acceptable salt, hydrate, solvate, acid salt hydrate, N-oxide or isomorphic crystalline form thereof;

wherein independently,

R_1 and R_2 are: H, lower alkyl, cyclic alkyl, or benzyl;

Y and Z are: $-[C(R)_2]_n-$, CHOR, O, S, NR, CONH, or NHCO, provided that Y and Z are not both O, both S, both NR, both CONH, both NHCO, or CONH and NHCO;

R_3, R_4, R_5, and R_7 are: H, I, Br, Cl, F, CH_3, CF_3, CN, SR, OCH_3, CH_2CH_3, or $CH(CH_3)_2$;

R_6 is: OR, H, SH, F, CF_3, lower alkyl, or $N(R)_2$;

R_8 is: OR, R, CH_2OR, CH_2NR_2, CH_2N+R_3, SR, CH_2SR;

X is: O, S, SO, SO_2, NR, $C(R)_2$, –lower alkyl-O-, -O-lower alkyl-, $COCH_2O$, or OCH_2CO;

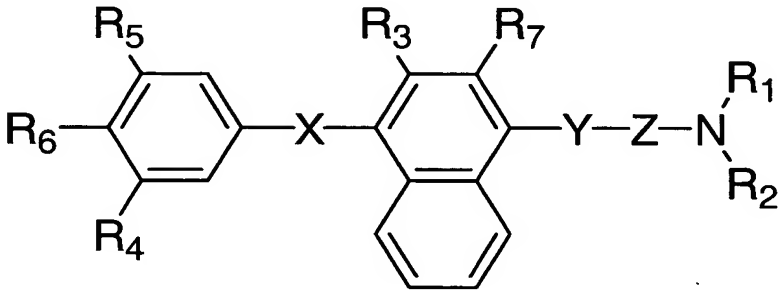
R is H, lower alkyl, aryl optionally substituted with 1-3 substituents selected from the group consisting of lower alkyl, halo, hydroxy, and alkoxy; or benzyl wherein said phenyl portion is optionally substituted with 1-3 substituents selected from the group consisting of lower alkyl, halo, hydroxy, and alkoxy; and

n is 1 to 6; and

provided that the compound is not thyronamine, 3,5-diiodothyronamine, 3,5,3'-triiodothyronamine, thyroxamine, 3,5,3',5'-tetraiodothyroethanolamine, 3,5,3'-triiodothyroethanolamine, or 3,5-diiodothyroethanolamine.

15. The compound of claim 14 wherein R_8 is H or OCH_3, Y is CONH, and Z is alkyl.

16. A compound of formula III:



or a stereoisomer, prodrug, pharmaceutically acceptable salt, hydrate, solvate, acid salt hydrate, N-oxide or isomorphic crystalline form therof;

wherein independently,

R_1 and R_2 are: H, lower alkyl, cyclic alkyl, or benzyl;

Y and Z are: $-[C(R)_2]_n-$, CHOR, O, S, NR, CONH, or NHCO, provided that Y and Z are not both O, both S, both NR, both CONH, both NHCO, or CONH and NHCO;

R_3, R_4, and R_5 are: I, Br, Cl, F, H, CH_3, CF_3, CN, SR, OCH_3, CH_2CH_3, or $CH(CH_3)_2$;

R_6 is: OH, H, SH, F, CF_3, lower alkyl, or $N(R)_2$;

R_7 is: OR, R, CH_2OR, CH_2NR_2, $CH_2N^+R_3$, SR, or CH_2SR;

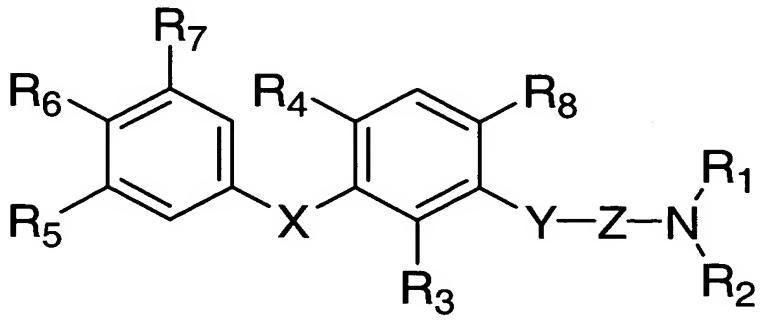
X is: O, S, SO, SO_2, NR, $C(R)_2$, –lower alkyl-O-, -O-lower alkyl-, $COCH_2O$, or OCH_2CO;

R is H, lower alkyl, aryl optionally substituted with 1-3 substituents selected from the group consisting of lower alkyl, halo, hydroxy, and alkoxy; or benzyl wherein said phenyl portion is optionally substituted with 1-3 substituents selected from the group consisting of lower alkyl, halo, hydroxy, and alkoxy; and

n is 1 to 6.

17. The compound of claim 16, wherein X is O.

18. A compound of formula IV:



or a stereoisomer, prodrug, pharmaceutically acceptable salt, hydrate, solvate, acid salt hydrate, N-oxide or isomorphic crystalline form therof;

wherein independently,

R_1 and R_2 are: H, lower alkyl, cyclic alkyl, or benzyl;

Y and Z are: $-[C(R)_2]_n-$, CHOR, O, S, NR, CONH, or NHCO, provided that Y and Z are not both O, both S, both NR, both CONH, both NHCO, or CONH and NHCO;

R_3, R_4, R_5, and R_7 are: I, Br, Cl, F, H, CH_3, CF_3, CN, SR, OCH_3, CH_2CH_3, or $CH(CH_3)_2$;

R_6 is: OH, H, SH, F, CF_3, lower alkyl, or $N(R)_2$;

R_8 is: OR, R, CH_2OR, CH_2NR_2, CH_2N+R_3, SR, CH_2SR

X is: O, S, SO, SO_2, NR, $C(R)_2$, –lower alkyl-O-, -O-lower alkyl-, $COCH_2O$, or OCH_2CO;

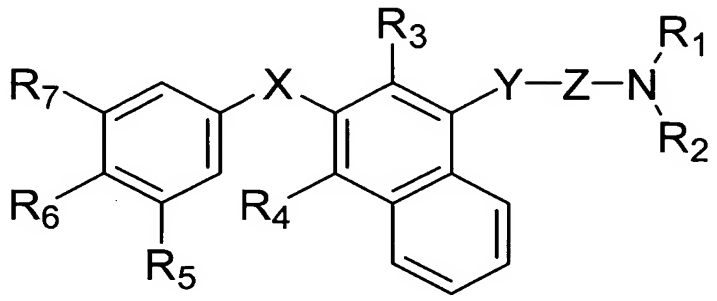
R is H, lower alkyl, aryl optionally substituted with 1-3 substituents selected from the group consisting of lower alkyl, halo, hydroxy, and alkoxy; or benzyl wherein said phenyl portion is optionally substituted with 1-3 substituents selected from the group consisting of lower alkyl, halo, hydroxy, and alkoxy; and

n is 1 to 6.

19. The compound of claim 18, wherein R_1 and R_2 are H or lower alkyl, R_6 is H, X is O, Y is O, and Z is alkyl.

20. The compound of claim 18, wherein Y is -CHR-, where R is aryl.

21. A compound of formula V:



or a stereoisomer, prodrug, pharmaceutically acceptable salt, hydrate, solvate, acid salt hydrate, N-oxide or isomorphic crystalline form thereof;

wherein independently,

R_1 and R_2 are: H, lower alkyl, cyclic alkyl, or benzyl;

Y and Z are: $-[C(R)_2]_n-$, CHOR, O, S, NR, CONH, or NHCO, provided that Y and Z are not both O, both S, both NR, both CONH, both NHCO, or CONH and NHCO;

R_3, R_4, R_5, and R_7 are: H, I, Br, Cl, F, CH_3, CF_3, CN, SR, OCH_3, CH_2CH_3, or $CH(CH_3)_2$;

R_6 is: OR, H, SH, F, CF_3, lower alkyl, or $N(R)_2$;

X is: O, S, SO, SO_2, NR, $C(R)_2$, –lower alkyl-O-, -O-lower alkyl-, $COCH_2O$, or OCH_2CO;

R is H, lower alkyl, aryl optionally substituted with 1-3 substituents selected from the group consisting of lower alkyl, halo, hydroxy, and alkoxy; or benzyl wherein said phenyl portion is optionally substituted with 1-3 substituents selected from the group consisting of lower alkyl, halo, hydroxy, and alkoxy; and

n is 1 to 6.

22. A pharmaceutical composition, comprising at least one pharmaceutically acceptable carrier or excipient and at least one compound of claim 1, claim 14, claim 16, claim 18, or claim 21, or thyronamine, 3,5-diiodothyronamine, 3,5,3'-triiodothyronamine, thyroxamine, 3,5,3',5'-tetraiodothyroethanolamine, 3,5,3'-triiodothyroethanolamine, or 3,5-diiodothyroethanolamine to the subject.

23. A method of exerting a positive inotropic effect on the heart without affecting the heart rate of a mammalian subject comprising the step of administering to said subject an effective amount of the compound of claim 1, claim 14, claim 16, claim 18, or claim 21, or thyronamine,

3,5-diiodothyronamine, 3,5,3'-triiodothyronamine, thyroxamine, 3,5,3',5'-tetraiodothyroethanolamine, 3,5,3'-triiodothyroethanolamine, or 3,5-diiodothyroethanolamine.

24. A method of exerting a negative inotropic effect on the heart without affecting the heart rate of a mammalian subject comprising the step of administering to said subject an effective amount of an antagonist of the compound of claim 1, claim 14, claim 16, claim 18, or claim 21, or thyronamine, 3,5-diiodothyronamine, 3,5,3'-triiodothyronamine, thyroxamine, 3,5,3',5'-tetraiodothyroethanolamine, 3,5,3'-triiodothyroethanolamine, or 3,5-diiodothyroethanolamine.

25. A method of lowering the core body temperature of a mammalian subject comprising the step of administering to said subject an effective amount of the compound of claim 1, claim 14, claim 16, claim 18, or claim 21, or thyronamine, 3,5-diiodothyronamine, 3,5,3'-triiodothyronamine, thyroxamine, 3,5,3',5'-tetraiodothyroethanolamine, 3,5,3'-triiodothyroethanolamine, or 3,5-diiodothyroethanolamine.

26. The method of claim 9, wherein administering the compound of claim 1 induces torpor or hibernation in said subject.

27. A method of treating a mammalian subject during surgery comprising administering to the subject a therapeutically effective amount of the compound of claim 1, claim 14, claim 16, claim 18, or claim 21, or thyronamine, 3,5-diiodothyronamine, 3,5,3'-triiodothyronamine, thyroxamine, 3,5,3',5'-tetraiodothyroethanolamine, 3,5,3'-triiodothyroethanolamine, or 3,5-diiodothyroethanolamine, or a stereoisomer, prodrug, pharmaceutically acceptable salt, hydrate, solvate, acid salt hydrate, N-oxide or isomorphic crystalline form thereof.

28. The method of claim 27, wherein said method reduces the core body temperature and induces anesthesia in the subject.

29. The method of claim 27, said method reduces blood loss of the subject.

30. A method for alleviating a disease state in a mammal believed to be responsive to treatment with a thyronamine agonist comprising the step of administering to the mammal a therapeutic amount of the compound of claim 1, claim 14, claim 16, claim 18, or claim 21, or thyronamine, 3,5-diiodothyronamine, 3,5,3'-triiodothyronamine, thyroxamine, 3,5,3',5'-tetraiodothyroethanolamine, 3,5,3'-triiodothyroethanolamine, or 3,5-diiodothyroethanolamine, or a stereoisomer, prodrug, pharmaceutically acceptable salt, hydrate, solvate, acid salt hydrate, N-oxide or isomorphic crystalline form thereof.

31. The method of claim 30, wherein said composition is an agonist of a G protein coupled receptor.

32. The method of claim 31, wherein said composition is an agonist of a trace amine receptor.

33. The method of claim 30, wherein the disease state is congestive heart failure.

34. The method of claim 30, wherein the disease state is fever or heatstroke.

35. The method of claim 30, wherein the disease state is bipolar disorder, depression, schizophrenia, eating disorders, anxiety, seizure, epilepsy, insomnia and sleeping disorders, gastro esophageal reflux disease, diseases involving gastrointestinal motility or asthma.

36. The method of claim 30, wherein the disease state is diabetes, hyperglycemia, hypoglycemia, cardiac arrhythmia, stroke, osteoporosis, obesity, atherosclerosis, hypertension, hyperthyroidism or hypothyroidism.

37. A method for alleviating a disease state in a mammal believed to be responsive to treatment with a thyronamine antagonist comprising the step of administering to the mammal a therapeutic amount of the compound of claim 1, claim 14, claim 16, claim 18, or claim 21, or thyronamine, 3,5-diiodothyronamine, 3,5,3'-triiodothyronamine, thyroxamine, 3,5,3',5'-tetraiodothyroethanolamine, 3,5,3'-triiodothyroethanolamine, or 3,5-diiodothyroethanolamine, or a stereoisomer, prodrug, pharmaceutically acceptable salt, hydrate, solvate, acid salt hydrate, N-oxide or isomorphic crystalline form thereof.

38. The method of claim 37, wherein said composition is an antagonist of a G protein coupled receptor.

39. The method of claim 38, wherein said composition is an antagonist of a trace amine receptor.

40. The method of claim 37, wherein the disease state is congestive heart failure.

41. The method of claim 37, wherein the disease state is fever or heatstroke.

42. The method of claim 37, wherein the disease state is bipolar disorder, depression, schizophrenia, eating disorders, anxiety, seizure, epilepsy, insomnia and sleeping disorders, gastro esophageal reflux disease, diseases involving gastrointestinal motility or asthma.

43. The method of claim 37, wherein the disease state is diabetes, hyperglycemia, hypoglycemia, cardiac arrhythmia, stroke, osteoporosis, obesity, atherosclerosis, hypertension, hyperthyroidism or hypothyroidism.

44. A method of treating a mammalian subject during open heart surgery believed to be responsive to treatment with a thyronamine antagonist comprising administering a therapeutically effective amount the compound of claim 1, claim 14, claim 16, claim 18, or claim 21, or thyronamine, 3,5-diiodothyronamine, 3,5,3'-triiodothyronamine, thyroxamine, 3,5,3',5'-tetraiodothyroethanolamine, 3,5,3'-triiodothyroethanolamine, or 3,5-diiodothyroethanolamine, or a stereoisomer, prodrug, pharmaceutically acceptable salt, hydrate, solvate, acid salt hydrate, N-oxide or isomorphic crystalline form thereof, to the subject.

45. A method of treating a mammalian subject during trauma or blood loss believed to be responsive to treatment with a thyronamine antagonist comprising administering a therapeutically effective amount the compound of claim 1, claim 14, claim 16, claim 18, or claim 21, or thyronamine, 3,5-diiodothyronamine, 3,5,3'-triiodothyronamine, thyroxamine, 3,5,3',5'-tetraiodothyroethanolamine, 3,5,3'-triiodothyroethanolamine, or 3,5-diiodothyroethanolamine, or a stereoisomer, prodrug, pharmaceutically acceptable salt, hydrate, solvate, acid salt hydrate, N-oxide or isomorphic crystalline form thereof, to the subject.

46. An isotopically labeled compound of claims claim 1, claim 14, claim 16, claim 18, or claim 21.

47. The compound of claim 46 isotopically labeled with ^{3}H, ^{2}H, or ^{125}I.

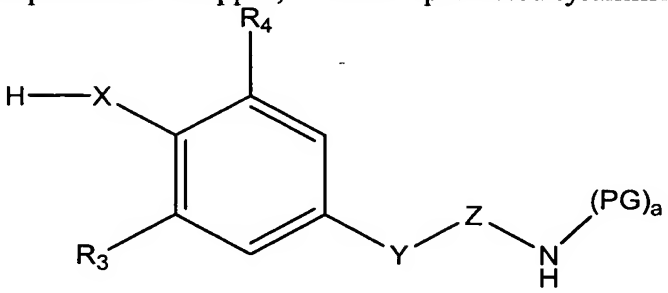
48. An antibody that specifically binds to the compound of claim 1, claim 14, claim 16, claim 18, or claim 21.

49. A method for preparing a protected phenylboronic acid, comprising the steps of:
providing a protected *p*-bromophenol; and
reacting said protected *p*-bromophenol with alkyl lithium and $B(OR)_3$; and
hydrolyzing the product of said reacting step to form a protected phenylboronic acid, where R is methyl, ethyl or propyl.

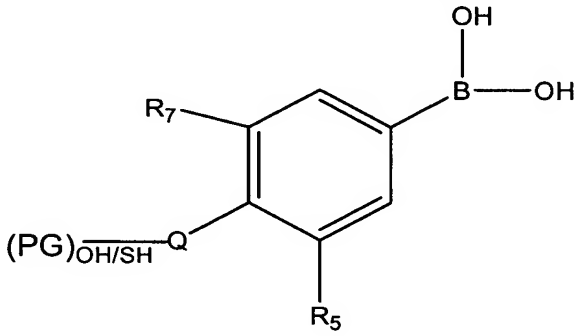
50. A method according to claim 49, wherein said protected *p*-bromophenol is protected with a moiety selected from trimethylsilyl, *tert*-butyldimethylsilyl, triisopropylsilyl and methoxymethylether.

51. A method for preparing a thyronamine derivative, comprising the steps of:

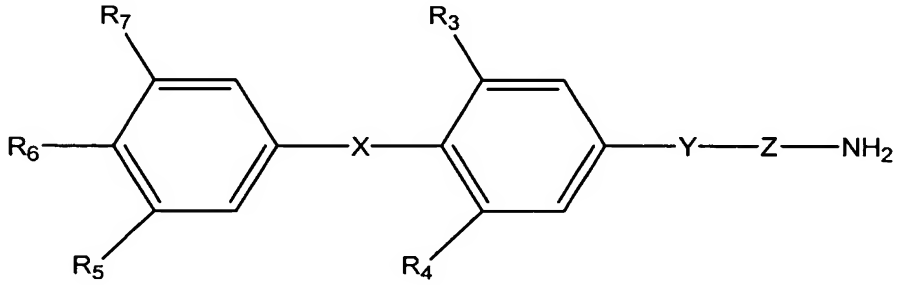
contacting, in the presence of copper, an amino-protected tyramine of the formula:



with a hydroxyl- or thiol-protected phenylboronic acid of the formula:



to form the structure of the formula:



or a stereoisomer, prodrug, pharmaceutically acceptable salt, hydrate, solvate, acid salt hydrate, N-oxide or isomorphic crystalline form thereof;

deprotecting said hydroxyl or thiol group; and

deprotecting said amino group;

wherein,

$(PG)_a$ is an amino protecting group;

$(PG)_{OH/SH}$ is a hydroxyl- or thiol-protecting group;

Q is: O or S;

Y and Z are: -[C(R)$_2$]$_n$-, CHOR, O, S, NR, CONH, or NHCO, provided that Y and Z are not both O, both S, both NR, both CONH, both NHCO, or CONH and NHCO;

R_3, R_4, R_5, and R_7 are: H, I, Br, Cl, F, CH_3, CF_3, CN, SR, OCH_3, CH_2CH_3, or $CH(CH_3)_2$;

R_6 is: OR, H, SH, F, CF_3, lower alkyl, or $N(R)_2$;

X is: O, S, SO, SO_2, NR, $C(R)_2$, –lower alkyl-O-, -O-lower alkyl-, $COCH_2O$, or OCH_2CO; and

R is H, lower alkyl, aryl optionally substituted with 1-3 substituents selected from the group consisting of lower alkyl, halo, hydroxy, and alkoxy; or benzyl wherein said phenyl portion is optionally substituted with 1-3 substituents selected from the group consisting of lower alkyl, halo, hydroxy, and alkoxy;

n is 1 to 6.

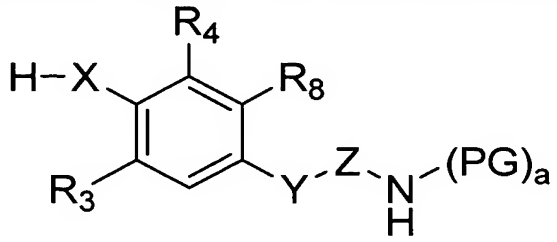
52. A method according to claim 51, further comprising the step of independently substituting an I, Br, Cl or F at the 3' position, 5' position or both the 3' position and the 5' position.

53. A method according to claim 51, further comprising the step of O-alkylating or S-alkylating the hydroxyl or thiol functionality of said compound.

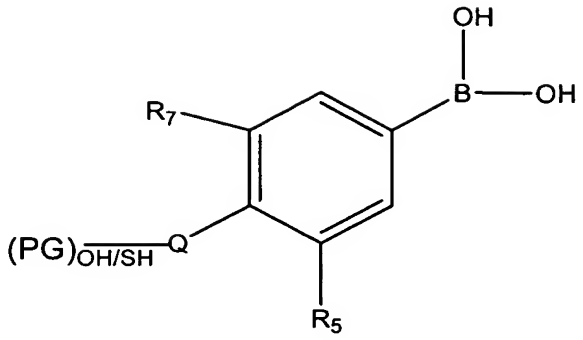
54. A method according to claim 51, further comprising the step of N-alkylating the amino functionality of said compound.

55. A method for preparing a thyronamine derivative, comprising the steps of:

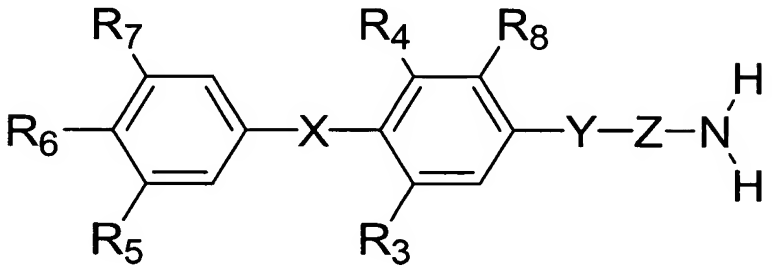
contacting, in the presence of copper, an amino-protected tyramine of the formula:



with a hydroxyl- or thiol-protected phenylboronic acid of the formula:



to form the structure of the formula:



or a stereoisomer, prodrug, pharmaceutically acceptable salt, hydrate, solvate, acid salt hydrate, N-oxide or isomorphic crystalline form thereof;

deprotecting said hydroxyl or thiol group; and

deprotecting said amino group;

wherein,

$(PG)_a$ is an amino protecting group;

$(PG)_{OH/SH}$ is a hydroxyl- or thiol-protecting group;

Q is: O or S;

Y and Z are: $-[C(R)_2]_n-$, CHOR, O, S, NR, CONH, or NHCO, provided that Y and Z are not both O, both S, both NR, both CONH, both NHCO, or CONH and NHCO;

R_3, R_4, R_5, and R_7 are: H, I, Br, Cl, F, CH_3, CF_3, CN, SR, OCH_3, CH_2CH_3, or $CH(CH_3)_2$;

R_6 is: OR, H, SH, F, CF_3, lower alkyl, or $N(R)_2$;

R_8 is: OR, R, CH_2OR, CH_2NR_2, CH_2N+R_3, SR, CH_2SR;

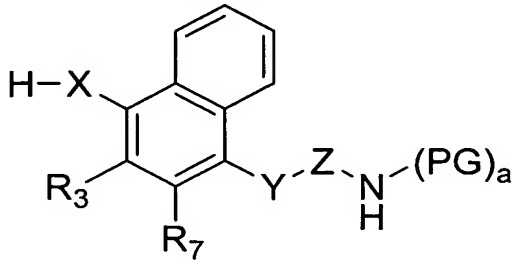
X is: O, S, SO, SO_2, NR, $C(R)_2$, –lower alkyl-O-, -O-lower alkyl-, $COCH_2O$, or OCH_2CO;

R is H, lower alkyl, aryl optionally substituted with 1-3 substituents selected from the group consisting of lower alkyl, halo, hydroxy, and alkoxy; or benzyl wherein said phenyl portion is optionally substituted with 1-3 substituents selected from the group consisting of lower alkyl, halo, hydroxy, and alkoxy; and

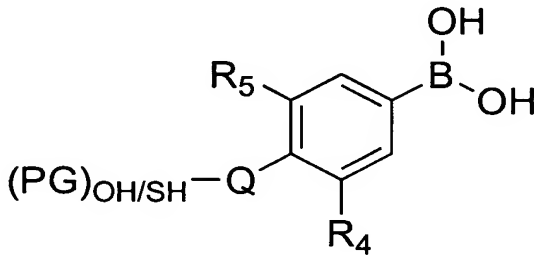
n is 1 to 6.

56. A method for preparing a thyronamine derivative, comprising the steps of:

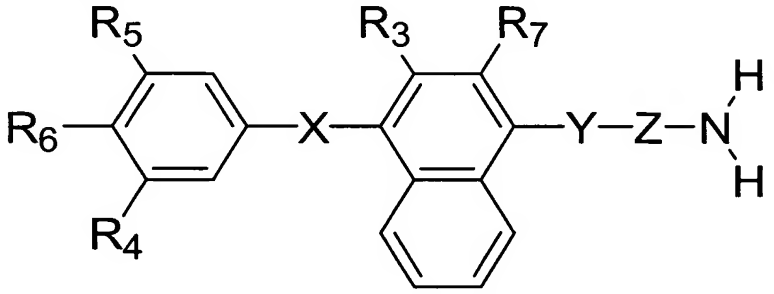
contacting, in the presence of copper, an amino-protected tyramine of the formula:



with a hydroxyl- or thiol-protected phenylboronic acid of the formula:



to form the structure of the formula:



or a stereoisomer, prodrug, pharmaceutically acceptable salt, hydrate, solvate, acid salt hydrate, N-oxide or isomorphic crystalline form thereof;

deprotecting said hydroxyl or thiol group; and

deprotecting said amino group;

wherein,

$(PG)_a$ is an amino protecting group;

$(PG)_{OH/SH}$ is a hydroxyl- or thiol-protecting group;

Q is: O or S;

Y and Z are: $-[C(R)_2]_n-$, CHOR, O, S, NR, CONH, or NHCO, provided that Y and Z are not both O, both S, both NR, both CONH, both NHCO, or CONH and NHCO;

R_3, R_4, and R_5 are: I, Br, Cl, F, H, CH_3, CF_3, CN, SR, OCH_3, CH_2CH_3, or $CH(CH_3)_2$;

R_6 is: OH, H, SH, F, CF_3, lower alkyl, or $N(R)_2$;

R_7 is: OR, R, CH_2OR, CH_2NR_2, $CH_2N^+R_3$, SR, or CH_2SR;

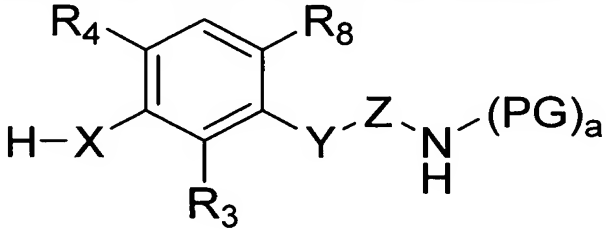
X is: O, S, SO, SO_2, NR, $C(R)_2$, –lower alkyl-O-, -O-lower alkyl-, $COCH_2O$, or OCH_2CO;

R is H, lower alkyl, aryl optionally substituted with 1-3 substituents selected from the group consisting of lower alkyl, halo, hydroxy, and alkoxy; or benzyl wherein said phenyl portion is optionally substituted with 1-3 substituents selected from the group consisting of lower alkyl, halo, hydroxy, and alkoxy; and

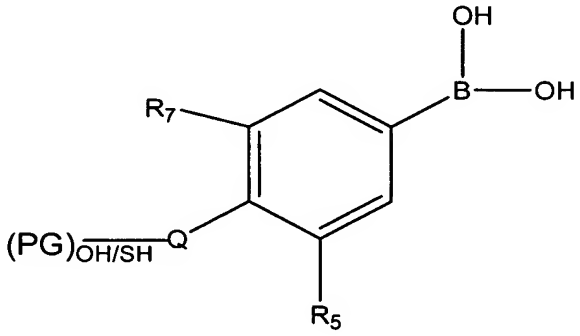
n is 1 to 6.

57. A method for preparing a thyronamine derivative, comprising the steps of:

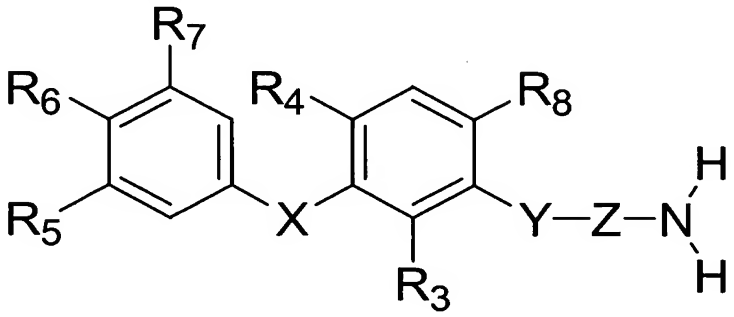
contacting, in the presence of copper, an amino-protected tyramine of the formula:



with a hydroxyl- or thiol-protected phenylboronic acid of the formula:



to form the structure of the formula:



or a stereoisomer, prodrug, pharmaceutically acceptable salt, hydrate, solvate, acid salt hydrate, N-oxide or isomorphic crystalline form thereof;

deprotecting said hydroxyl or thiol group; and

deprotecting said amino group;

wherein,

$(PG)_a$ is an amino protecting group;

$(PG)_{OH/SH}$ is a hydroxyl- or thiol-protecting group;

Q is: O or S;

Y and Z are: $-[C(R)_2]_n-$, CHOR, O, S, NR, CONH, or NHCO, provided that Y and Z are not both O, both S, both NR, both CONH, both NHCO, or CONH and NHCO;

R_3, R_4, R_5, and R_7 are: I, Br, Cl, F, H, CH_3, CF_3, CN, SR, OCH_3, CH_2CH_3, or $CH(CH_3)_2$;

R_6 is: OH, H, SH, F, CF_3, lower alkyl, or $N(R)_2$;

R_8 is: OR, R, CH_2OR, CH_2NR_2, CH_2N+R_3, SR, CH_2SR

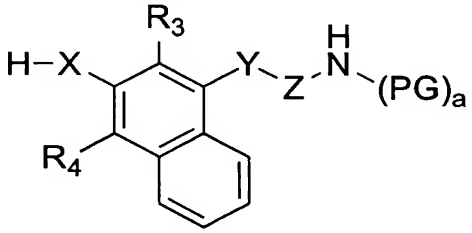
X is: O, S, SO, SO_2, NR, $C(R)_2$, –lower alkyl-O-, -O-lower alkyl-, $COCH_2O$, or OCH_2CO;

R is H, lower alkyl, aryl optionally substituted with 1-3 substituents selected from the group consisting of lower alkyl, halo, hydroxy, and alkoxy; or benzyl wherein said phenyl portion is optionally substituted with 1-3 substituents selected from the group consisting of lower alkyl, halo, hydroxy, and alkoxy; and

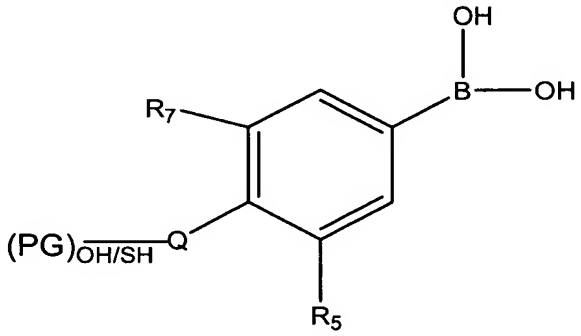
n is 1 to 6.

58. A method for preparing a thyronamine derivative, comprising the steps of:

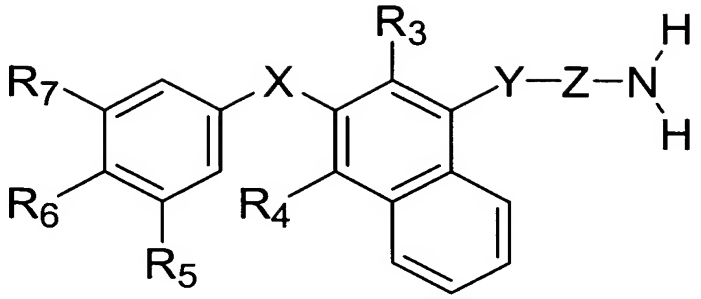
contacting, in the presence of copper, an amino-protected tyramine of the formula:



with a hydroxyl- or thiol-protected phenylboronic acid of the formula:



to form the structure of the formula:



or a stereoisomer, prodrug, pharmaceutically acceptable salt, hydrate, solvate, acid salt hydrate, N-oxide or isomorphic crystalline form thereof;

deprotecting said hydroxyl or thiol group; and

deprotecting said amino group;

wherein,

$(PG)_a$ is an amino protecting group;

$(PG)_{OH/SH}$ is a hydroxyl- or thiol-protecting group;

Q is: O or S;

Y and Z are: $-[C(R)_2]_n-$, CHOR, O, S, NR, CONH, or NHCO, provided that Y and Z are not both O, both S, both NR, both CONH, both NHCO, or CONH and NHCO;

R_3, R_4, R_5, and R_7 are: H, I, Br, Cl, F, CH_3, CF_3, CN, SR, OCH_3, CH_2CH_3, or $CH(CH_3)_2$;

R_6 is: OR, H, SH, F, CF_3, lower alkyl, or $N(R)_2$;

X is: O, S, SO, SO_2, NR, $C(R)_2$, –lower alkyl-O-, -O-lower alkyl-, $COCH_2O$, or OCH_2CO;

R is H, lower alkyl, aryl optionally substituted with 1-3 substituents selected from the group consisting of lower alkyl, halo, hydroxy, and alkoxy; or benzyl wherein said phenyl portion is optionally substituted with 1-3 substituents selected from the group consisting of lower alkyl, halo, hydroxy, and alkoxy; and

n is 1 to 6.